

CLAIMS

WHAT IS CLAIMED IS:

1. A battery comprising an electrode plate unit,
including:

5 a plurality of positive electrode plates and a plurality
of negative electrode plates that are alternately stacked upon
one another with intervening separators therebetween, thereby
constituting a group of electrode plate, wherein lateral edges
of the positive electrode plates protrude beyond the negative
10 electrode plates on one side, and lateral edges of the negative
electrode plates protrude beyond the group of positive
electrode plates on the opposite side; and

a positive electrode collector plate and a negative
electrode collector plate that are respectively bonded to said
15 protruded lateral edges of the positive electrode plates and
the negative electrode plates, wherein the positive electrode
collector plate and the negative electrode collector plate are
formed with protruded portions on a surface which is to be
bonded to the lateral edges of the positive electrode plates
20 and the negative electrode plates.

2. The battery according to Claim 1, wherein a plurality
of elongated protrusions that extend along a direction in which
the electrode plates are stacked are formed at predetermined
intervals on the positive and negative collector plates.

3. The battery according to Claim 1, wherein the collector plates are made of either one of nickel sheet or nickel-plated steel sheet.

4. The battery according to Claim 1, wherein a solder material is attached at portions in the positive and negative collector plates that are to be bonded to the lateral edges of the electrode plate group.

5. The battery according to Claim 4, wherein the solder material is applied on the positive and negative collector plates beforehand and is reflowed afterwards.

6. A battery comprising an electrode plate unit, including:

a plurality of positive electrode plates and a plurality of negative electrode plates that are alternately stacked upon one another with intervening separators therebetween; and

a collector plate welded to lateral edges of at least one of the positive electrode plates and the negative electrode plates, wherein the lateral edges of the positive electrode plates or the negative electrode plates are formed with bent portions.

7. A battery comprising an electrode plate unit, including:

a plurality of positive electrode plates and a plurality of negative electrode plates that are alternately stacked upon one another with intervening separators therebetween, thereby

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constituting a group of electrode plate, wherein lateral edges of the positive electrode plates protrude beyond the negative electrode plates on one side, and lateral edges of the negative electrode plates protrude beyond the group of positive electrode plates on the opposite side, said lateral edges of the positive electrode plates and the negative electrode plates being formed with slits; and

a positive electrode collector plate and a negative electrode collector plate that are respectively bonded to said protruded lateral edges of the positive electrode plates and the negative electrode plates.

8. A battery comprising an electrode plate unit, including:

a plurality of positive electrode plates and a plurality of negative electrode plates that are alternately stacked upon one another with intervening separators therebetween, said positive electrode plates and negative electrode plates having their respective lead portions along one lateral edge thereof; and

a collector plate welded to the lead portions of at least one of the positive electrode plates and the negative electrode plates, wherein said lead portions include locating means for positioning the lateral edges of the positive or negative electrode plates with respect to the collector plate.

9. The battery according to Claim 8, wherein the locating means is a hole or a cut-out.

10. The battery according to Claim 9, wherein the locating means comprises one circular hole and one oblong hole.

5 11. The battery according to Claim 8, wherein the lead portions of the positive electrode plates are provided with a reinforcing material.

12. A method of manufacturing an electrode plate unit for a battery comprising the steps of:

10 stacking a plurality of positive electrode plates and a plurality of negative electrode plates alternately upon one another with intervening separators therebetween;

bringing a collector plate in tight contact with lateral edges on one lateral side of the positive or negative electrode
15 plates; and

applying heat to the collector plate on an opposite surface of the electrode plates from a non-contact type heat source at several locations in lines along a direction in which the electrode plates are stacked.

20 13. The method of manufacturing an electrode plate unit for a battery according to Claim 12, wherein a solder material is attached on the collector plate on a surface which is contacted with the electrode plates along a plurality of lines in the direction in which the electrode plates are stacked, and
25 heat is applied upon said solder material.

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14. The method of manufacturing an electrode plate unit for a battery according to Claim 12, wherein the positive or negative electrode plates are pressed against a locating means so that the lateral edges on one lateral side of the positive or negative electrode plates are aligned, and heat is applied to the collector plate in a state wherein the collector plate is tightly pressed against the lateral edges of the positive or negative electrode plates.

15. The method of manufacturing an electrode plate unit for a battery according to Claim 12, wherein heat is applied to the collector plate by irradiating an electronic beam within a vacuum.

16. The method of manufacturing an electrode plate unit for a battery according to Claim 15, wherein the collector plate, together with the electrode plates in contact therewith, is demagnetized before the application of heat.

17. A method of manufacturing an electrode plate unit for a battery comprising the steps of:

stacking a plurality of positive electrode plates and a plurality of negative electrode plates alternately upon one another with intervening separators therebetween, such that lateral edges of the positive electrode plates protrude beyond the negative electrode plates on one side, and lateral edges of the negative electrode plates protrude beyond the group of positive electrode plates on the opposite side; and

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welding a collector plate to the lateral edges of at least one of the positive electrode plates and the negative electrode plates, wherein a solder material is arranged in advance to the collector plate at locations to be bonded to the lateral edges of the positive or negative electrode plates.

18. The method of manufacturing an electrode plate unit for a battery according to Claim 17, wherein the solder material is applied on the collector plate by electrolytic or non-electrolytic plating.

19. The method of manufacturing an electrode plate unit for a battery according to Claim 17, wherein the solder material is attached on the collector plate by welding a sheet-like solder material to the collector plate.

20. The method of manufacturing an electrode plate unit for a battery according to Claim 17, wherein the solder material is attached on the collector plate on a surface which is contacted with the electrode plates along a plurality of lines in the direction in which the electrode plates are stacked, and heat is applied upon said solder material.

21. A method of manufacturing an electrode plate unit for a battery comprising the steps of:

stacking a plurality of positive electrode plates and a plurality of negative electrode plates alternately upon one another with intervening separators therebetween, such that lateral edges of the positive electrode plates protrude beyond

the negative electrode plates on one side, and lateral edges of the negative electrode plates protrude beyond the group of positive electrode plates on the opposite side;

pressing the positive or negative electrode plates against
5 a locating means so that the lateral edges on one lateral side of the positive or negative electrode plates are aligned;

bringing a collector plate in tight contact with said aligned lateral edges on one lateral side of the positive or negative electrode plates; and

10 applying heat to the collector plate on an opposite surface of the electrode plates from a non-contact type heat source at several locations in lines along a direction in which the electrode plates are stacked.

22. The method of manufacturing an electrode plate unit
15 for a battery according to Claim 21, wherein heat is applied to the collector plate by irradiating an electronic beam within a vacuum.

23. The method of manufacturing an electrode plate unit for a battery according to Claim 22, wherein the collector
20 plate, together with the electrode plates in contact therewith, is demagnetized before the application of heat.

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